

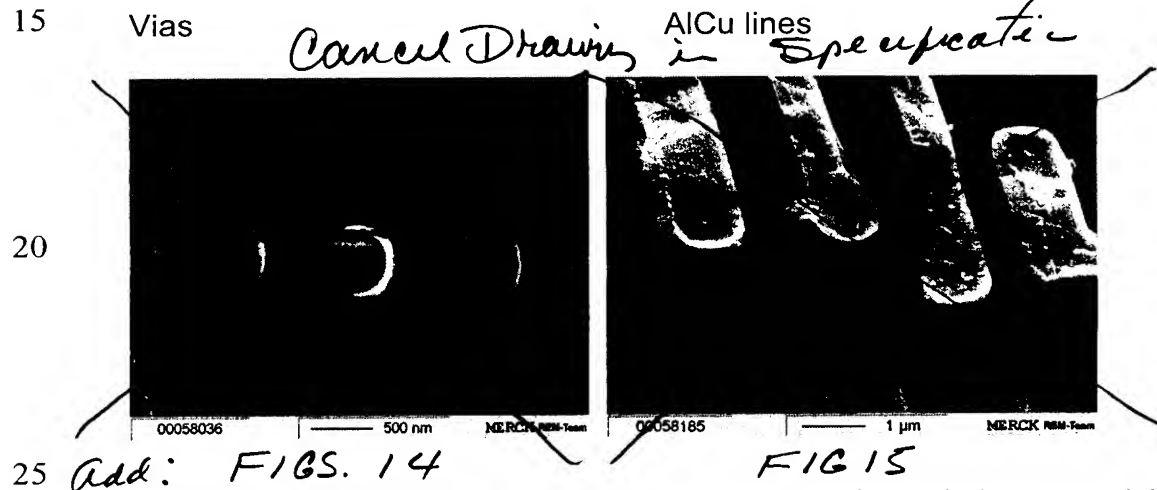
## Examples

For better understanding and in order to illustrate the invention, examples are reproduced below, also in the form of pictures which show the cleaning result. The compositions used are within the scope of protection of the present invention. The examples thus also serve to illustrate the invention. Owing to the general validity of the inventive principle described, however, the examples are not suitable for reducing the scope of protection of the present application merely to these.

The temperatures given in the examples are always in °C.

### Example 1

Reference (post-ash residue) before cleaning



The cleaning is carried out with an aqueous cleaning solution comprising the following components:

- |                     |          |
|---------------------|----------|
| • citric acid       | 5%       |
| • hydrogen peroxide | 2%       |
| • NMP               | 1%       |
| • Tween 20          | 1000 ppm |

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Process parameters for Semitool SAT spray tool:

| Step | Name            | Time   | RPM     | Temp. |     | DRAIN |
|------|-----------------|--------|---------|-------|-----|-------|
| 1    | Polymer removal | 5 min  | 50 rpm  | 60°C  |     | Tank  |
| 2    | Purge           | 10 sec | 50 rpm  |       | N2  | Tank  |
| 3    | DI rinse 1      | 5 min  | 50 rpm  | RT    | H2O | Drain |
| 4    | DI rinse 2      | 2 min  | 300 rpm | RT    |     |       |
| 4    | Purge           | 10 sec | 300 rpm |       | N2  | Drain |
| 5    | Dry 1           | 2 min  | 750 rpm | hot   | N2  |       |
| 6    | Dry 2           | 8 min  | 300 rpm | hot   | N2  |       |

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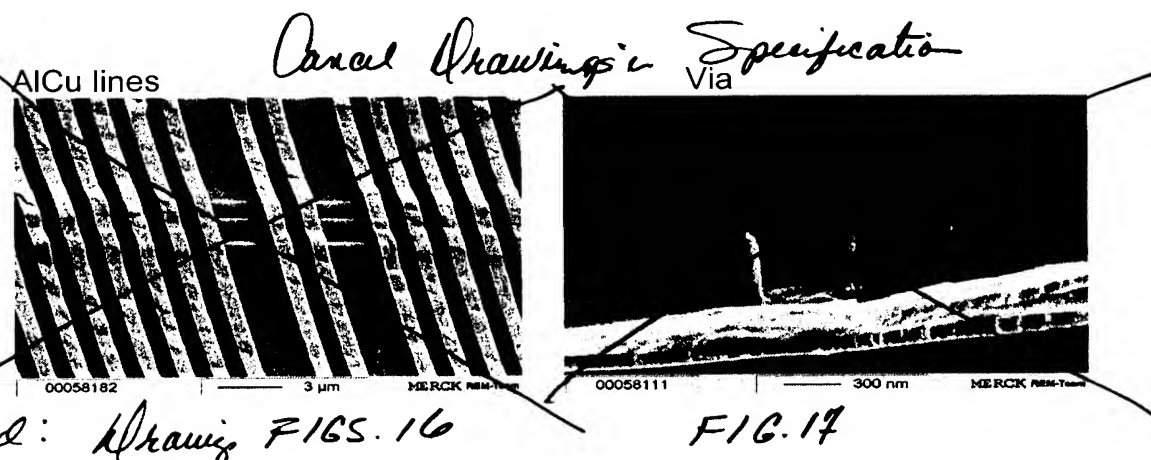
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## Example 2

The cleaning is carried out with an aqueous cleaning solution comprising the following components:

- citric acid 5%
- hydrogen peroxide 2%
- oleic hydroxyethyl imidazoline 1000 ppm

Process parameters for Arias wet bench

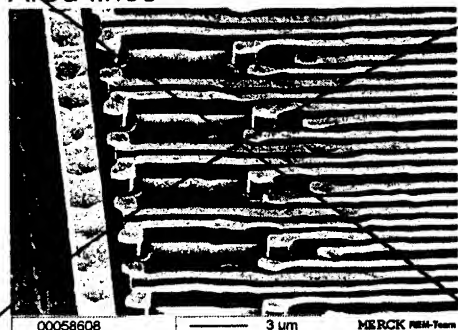
| STEP | NAME            | TIME   | Temp |     | Drain |
|------|-----------------|--------|------|-----|-------|
| 1    | Polymer removal | 20 min | 60°C |     |       |
| 2    | DI rinse 1      | 10 min | RT   | H2O |       |
| 3    | Dry 1           | 2 min  | hot  | N2  |       |
| 4    | Dry 2           | 8 min  | hot  | N2  |       |

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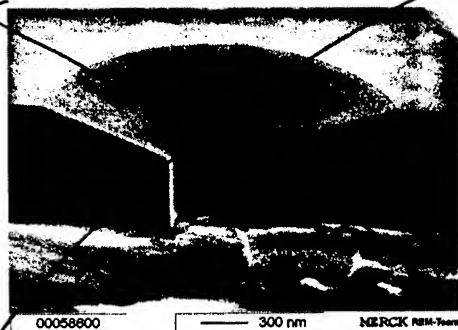
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AlCu lines



Via



*Add: FIGS. 18*

*FIGS. 19*

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### Example 3

Comparison with a commercially available organic polymer remover

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1. Polymer remover (comprises hydroxylamine, catechol, monoethanolamine)

75°C, 20 min (beaker)

2. IPA RT, 3 min

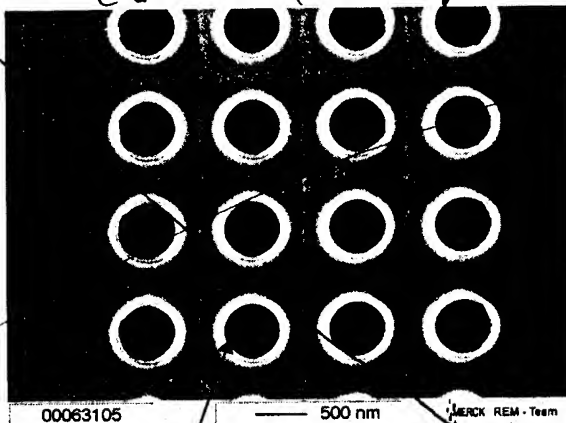
3. DI water RT, 5 min

4. N2 blow drying

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*Add: FIG. 20*

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Incipient etching of the AlCu metallisation

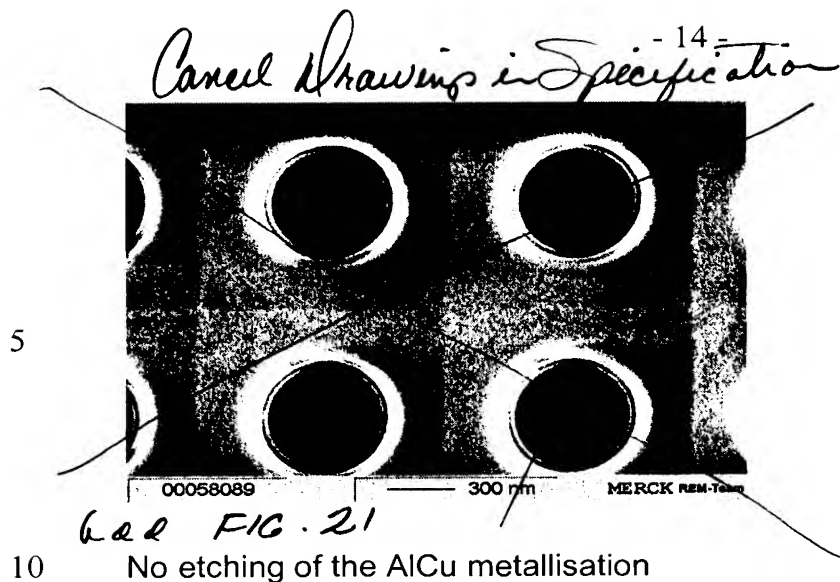
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1. Citric acid 5% / peroxide 2% / NMP 1% / Tween 20 1000 ppm

60°C, 20 min (beaker)

2. DI water 10 min

3. N2 blow drying



Explanation of figures:

15 Figure 5: Plot of mass removal of a sputtered Al/Cu layer as a function of exposure time. The solution used consisted of an aqueous solution of 5% of citric acid, 2% of peroxide, 1% of NMP. The dark curve shows removal without corrosion inhibitor. The pale line shows removal with addition of a corrosion inhibitor.

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Figure 6: Plot of mass removal of a CVO-deposited tungsten layer as a function of exposure time. The solution used (see Figure 5).

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Figure 13: Plot of the etching rate (removal/time) of various coatings, with/without addition of a corrosion inhibitor to the solution (see Figure 5).

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